

CATALOG DOCUMENTATION
REGIONAL ENVIRONMENTAL MONITORING AND ASSESSMENT PROGRAM - REGION 10
1994-1995 WASHINGTON/OREGON COASTAL STREAMS AND YAKIMA RIVER BASIN STREAMS
VALIDATED WATER CHEMISTRY DATA

TABLE OF CONTENTS

1. DATA SET IDENTIFICATION
2. INVESTIGATOR INFORMATION
3. DATA SET ABSTRACT
4. OBJECTIVES AND INTRODUCTION
5. DATA ACQUISITION AND PROCESSING METHODS
6. DATA MANIPULATIONS
7. DATA DESCRIPTION
8. GEOGRAPHIC AND SPATIAL INFORMATION
9. QUALITY CONTROL / QUALITY ASSURANCE
10. DATA ACCESS
11. REFERENCES
12. TABLE OF ACRONYMS
13. PERSONNEL INFORMATION

1. DATA SET IDENTIFICATION

1.1 Title of Catalog Document

Regional Environmental Monitoring and Assessment Program - Region 10
1994-1995 Washington/Oregon Coastal Streams and Yakima Basin Streams
Validated Water Chemistry Data Set

1.2 Authors of the Catalog Entry

U.S. EPA NHEERL Western Ecology Division
Corvallis, OR

1.3 Catalog Revision Date

23 March 1999

1.4 Data Set Name

CHMVAL

1.5 Task Group

Region 10

1.6 Data Set Identification Code

00004

1.7 Version

001

1.8 Requested Acknowledgment

These data were produced as part of the U.S. EPA's Environmental Monitoring and Assessment Program (EMAP). If you publish these data or use them for analyses in publication, EPA requires a standard statement for work it has supported:

"Although the data described in this article have been funded wholly or in part by the U. S. Environmental Protection Agency through its Regional EMAP program, it has not been subjected to Agency review, and therefore does not necessarily reflect the views of the Agency and no official endorsement should be inferred."

2. INVESTIGATOR INFORMATION

2.1 Principal Investigators

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2.2 Investigation Participant - Sample Collection

U.S. Environmental Protection Agency
Office of Research and Development
Region 10
Oregon Department of Environmental Quality
Washington State Department of Ecology
Oregon State University
University of Washington
Yakama Indian Nation Environmental Protection Program

3. DATA SET ABSTRACT

3.1 Abstract of the Data Set

The CHEM data set contains the results of analysis of water chemistry for a grab samples taken at mid-channel for each stream reach. This data set also contains data from in situ measurements taken at mid-channel using field meters.

3.2 Keywords for the Data Set

Aluminum, alkalinity, acid neutralizing capacity, calcium, carbonate, color, specific conductance, dissolved inorganic carbon, dissolved organic carbon, bicarbonate, potassium, magnesium, ammonium, sodium, nitrate, total nitrogen, pH, total phosphorus, silica, total suspended solids, turbidity

4. OBJECTIVES AND INTRODUCTION

4.1 Program and Project Objectives

4.1.1 Program Objective

The Regional Environmental Assessment and Monitoring Program (R-EMAP) was initiated to test the applicability of the EMAP approach to answer questions about ecological conditions at regional and local scales. Using EMAP's statistical design and indicator concepts, R-EMAP conducts projects at smaller geographic scales and in shorter time frames.

4.1.2 Project Objective

The objectives of Region 10 1994-1995 Washington/Oregon Coastal Streams and Yakima Basin Streams R-EMAP project were to:

1. Determine the ecological condition of wadeable, 1st-order through 3rd-order streams of the Coast Range Ecoregion and the Yakima River Basin (Columbia Basin Ecoregion).
2. Determine the relationship between the ecological condition of these streams and the predominant land used of the watersheds.
3. Provide the states of Washington and Oregon with information that would assist in the development of water quality biological criteria using indices based on fish/amphibian and invertebrate taxa assemblage information.
4. Determine the applicability of EMAP-derived methods for assessments of ecological condition within streams in the states of Washington and Oregon.

4.2 Data Set Objective

The primary function of the stream water chemistry samples is to determine acid-base status, trophic condition (nutrient status), chemical stressors, and classification of water chemistry type.

4.3 Data Set Background Discussion

Water chemistry in streams is analyzed for two purposes. First, to understand the chemical habitat within which biota must exist so that we can understand the biological potential of the system and second, to evaluate the chemical quality of the water for the purposes of determining the potential stresses to which the biota are exposed.

4.4 Summary of Data Set Parameters

Water chemistry parameters are reported for one sample taken at the midpoint of the selection stream reach. These include: aluminum, alkalinity, acid neutralizing capacity, calcium, carbonate, color, specific conductance, dissolved inorganic carbon, dissolved organic carbon, bicarbonate, potassium, magnesium, ammonium, sodium, nitrate, total nitrogen, pH, total phosphorus, silica, total suspended solids, and turbidity.

5. DATA ACQUISITION AND PROCESSING METHODS

5.1 Data Acquisition

5.1.1 Sampling Objective

To obtain a sample of water from each stream reach for the purpose of chemical analysis.

5.1.2 Sample Collection Methods Summary

A series of grab samples was taken below the surface using a 500 ml beaker and composited into a single 4-L bulk water sample. Sampling was conducted according to protocols identified in Chaloud and Peck (1994) and Hayslip et al. (1994).

5.1.3 Sampling Start Date

May 1994

May 1995

5.1.4 Sampling End Date

Oct 1994

Sept 1995

5.1.5 Platform

NA

5.1.6 Sampling Equipment

500 ml plastic beaker, 4-L Cubitainer, 250 ml plastic beakers, 250 ml rinse bottle filled with deionized water, rinse/test 125 ml bottles of quality control check (QCC) solution, thermometer, pH meter, dissolved oxygen (DO) meter, conductivity meter

5.1.7 Manufacturer of Sampling Equipment

NA

5.1.8 Key Variables

NA

5.1.9 Sampling Method Calibration

See Chaloud and Peck (1994) and Hayslip et al. (1994).

5.1.10 Sample Collection Quality Control

Chaloud, D.J. and D.V. Peck. 1994. Environmental Monitoring and Assessment Program - Surface Waters: Integrated Quality Assurance Project Plan for the Surface Waters Resource Group, 1994 Activities. EPA 600/X-91/080, Rev. 2.00. U.S. Environmental Protection Agency, Office of Research and Development, Las Vegas, NV 89193.

Hayslip, G. A. (editor). 1993. EPA Region 10 In-stream Biological Monitoring Handbook (for wadeable streams in the Pacific Northwest). EPA-910/9-92-013. U. S. Environmental Protection Agency - Region 10, Environmental Services Division, Seattle, WA 98101.

Merritt, G.D. 1994. Biological Assessment of wadeable Streams in the Coast Range Ecoregion and the Yakima River Basin: Final Quality Assurance Project Plan. Washington State Department of Ecology, Environmental Investigations and Laboratory Services, Olympia, WA, 15 pp.

5.1.11 Sample Collection Method Reference

Hayslip, G. A. (editor). 1993. EPA Region 10 In-stream Biological Monitoring Handbook (for wadeable streams in the Pacific Northwest). EPA-910/9-92-013. U. S. Environmental Protection Agency - Region 10, Environmental Services Division, Seattle, WA 98101.

Hayslip, G., D.J. Klemm, J.M. Lazorchak. 1994. Environmental Monitoring and Assessment Program Surface Waters and Region 10 Regional Environmental Monitoring and Assessment Program: 1994 Pilot Field Operations and Methods Manual for Streams on the Coast Range Ecoregion of Oregon and Washington and the Yakima River Basin. Office of Research and Development, U.S. Environmental Protection Agency, Cincinnati, OH.

Lazorchak, J.M., D.J. Klemm, and D.V. Peck. (editors). 1998. Environmental Monitoring and Assessment Program - Surface Waters: Field Operations and Methods for Measuring the Ecological Condition of Wadeable Streams. EPA/620/R-94/004F. U.S. Environmental Protection Agency, Washington, D.C.

Oregon Department of Environmental Quality. 1993. DEQ Laboratory Field Sampling Reference Guide. Oregon Department of Environmental Quality, Portland, OR. 29 p.

Washington Department of Ecology. 1993. Field Sampling and Measurement Protocols for the Watershed Assessment Section. Washington State Department of Ecology, Olympia, WA.

5.1.12 Sample Collection Method Deviations

NA

5.2 Data Preparation and Sample Processing

5.2.1 Sample Processing Objective

See Hayslip et al. (1994) and Hayslip (1993).

5.2.2 Sample Processing Methods Summary

See Hayslip et al. (1994) and Hayslip (1993).

5.2.3 Sample Processing Method Calibration

See Hayslip et al. (1994) and Hayslip (1993).

5.2.4 Sample Processing Quality Control

See Chaloud and Peck (1994), Merritt (1994), and Hayslip (1993).

5.2.5 Sample Processing Method Reference

See Hayslip et al. (1994) and Hayslip (1993).

6. DATA MANIPULATIONS

6.1 Name of New or Modified Values

NA

6.2 Data Manipulation Description

NA

6.3 Data Manipulation Description

NA

7. DATA DESCRIPTION

7.1 Description of Parameters

#	Parameter Data			Parameter	
	SAS Name	Type	Len	Format	Label
4	ALK	Num	8	F	Total Alkalinity (ueq/L)
29	ALKF	Char	8		Flag For ALK
5	BOD_5	Num	8		5 Day BOD (mg/L)
30	BOD_5F	Char	8		Flag for BOD_5
6	CA	Num	8		Calcium (ueq/L)
45	CAF	Char	16		Flag for CA
7	CL	Num	8	F	Chloride (ueq/L)
42	CLF	Char	16		Flag For CL
8	COND	Num	8	F	Stream Conductivity (uS/cm)
31	CONDF	Char	8		Flag For COND
48	DATECOL	Char	12	\$	Date sample Collected
2	DATE_COL	Num	8	DATE	Date sample Collected
9	DO	Num	8	F	Stream Dissolved Oxygen (mg/L)
10	DOC	Num	8	F	Dissolved Organic Carbon (mg/L)
32	DOCF	Char	8		Flag For DOC
11	DO_SAT	Num	8		Diss. Oxygen % Saturation
33	FLOWF	Char	8		Flag for FLOW_CFS
12	FLOW_CFS	Num	8	F	Instantaneous Discharge (cfs)
13	HARDNESS	Num	8		Hardness - Total Dissolved (mg/L)
14	K	Num	8		Potassium (ueq/L)
46	KF	Char	16		Flag for K
56	LAT_DD	Num	8		Latitude (decimal degrees)
55	LON_DD	Num	8		Longitude (decimal degrees)
15	MG	Num	8		Magnesium (ueq/L)
43	MGF	Char	16		Flag for MG
16	NA	Num	8		Sodium (ueq/L)
44	NAF	Char	16		Flag for NA
17	NH4	Num	8	F	Ammonium (ueq/L)
34	NH4F	Char	8		Flag For NH4
18	NO3	Num	8	F	Nitrate (ueq/L)
47	NO3F	Char	8		Flag For NO3
51	NTL	Num	8	F	Total Nitrogen (ug/L)
52	NTLF	Char	8		NTL_F
3	OR_ID	Char	6	\$	OR REMAP/DEQ STORET Stream ID
20	PH	Num	8	F	Stream pH
35	PHF	Char	8		Flag For PH
21	PO4	Num	8		Orthophosphate (ug/L-P)
36	PO4F	Char	8		Flag for PO4
22	PTL	Num	8	F	Total Phosphorous (ug/L)
37	PTLF	Char	8		Flag For PTL
54	SAMPLED	Char	30		Site Sampled Code
23	SO4	Num	8	F	Sulfate (ueq/L)
41	SO4F	Char	16		Flag For SO4
19	SOBC	Num	8		Sum of Base Cations (ueq/L)
1	STRM_ID	Char	7	\$	REMAP Stream Identifier
24	TEMPSTRM	Num	8	F	Stream Temperature (oC)
25	TKN	Num	8		Total Kjeldahl Nitrogen (ug/L)
38	TKNF	Char	8		Flag For TKN

26	TOC	Num	8	Total Organic Carbon (mg/L)
39	TOCF	Char	8	Flag for TOC
49	TSS	Num	8 F	Total Suspended Solids (mg/L)
50	TSSF	Char	8	TSS_F
27	TURB	Num	8	Turbidity (FTU)
40	TURBF	Char	8	Flag For TURB
28	VISIT_NO	Num	8 F	Sample Visit Number
53	YEAR	Num	8	

7.1.1.1 Precision to which values are reported

7.1.1.2 Minimum Value in Data Set

Name	Min

ALK	79.52836
BOD_5	0.1
CA	64.87
CL	0.84618
COND	18
DATE_COL	05/16/1994
DO	1.1
DOC	0.5
DO_SAT	1
FLOW_CFS	0
HARDNESS	5
K	6.39425
LAT_DD	42.1114
LON_DD	-124.5862217
MG	41.144
NA	130.494
NH4	0.71393
NO3	0.71393
NTL	10
PH	5.52
PO4	2.5
PTL	5
SO4	5.205
SOBC	242.9
TEMPSTRM	4.8
TKN	30
TOC	0.25
TSS	1
TURB	0.5
VISIT_NO	1
YEAR	1994

7.1.3 Maximum Value in Data Set

Name	Max
ALK	4815.662
BOD_5	8.8
CA	1996
CL	2820.6
COND	600
DATE_COL	09/29/1995
DO	12.15
DOC	13
DO_SAT	113
FLOW_CFS	445.825
HARDNESS	140
K	71.6156
LAT_DD	48.1784
LON_DD	-119.5619
MG	789.9648
NA	1652.924
NH4	128.5074
NO3	167.05962
NTL	3270
PH	8.58
PO4	130
PTL	580
SO4	782.832
SOBC	4456.24
TEMPSTRM	25.3
TKN	3200
TOC	18
TSS	81
TURB	178
VISIT_NO	3
YEAR	1995

7.2 Data Record Example

7.2.1 Column Names for Example Records

"ALK","ALKF","BOD_5","BOD_5F","CA","CAF","CL","CLF","COND","CONDF","DATECOL","DATE_COL","DO","DOC","DOCF","DO_SAT","FLOWF","FLOW_CFS","HARDNESS","K","KF","LAT_DD","LON_DD","MG","MGF","NA","NAF","NH4","NH4F","NO3","NO3F","NTL","NTLF","OR_ID","PH","PHF","PO4","PO4F","PTL","PTLF","SAMPLED","SO4","SO4F","SOBC","STRM_ID","TEMPSTRM","TKN","TKNF","TOC","TOCF","TSS","TSSF","TURB","TURBF","VISIT_NO","YEAR"

7.2.2 Example Data Records

379.658,"J",2.1," ",279.44," ",.,," ",75.000," "," ",21JUL1995,7.700,3.000," ",75," ",.,.,20.4616," ",45.991677169,-122.8964313,181.0336," ",252.2884," ",1.428," ",17.848," ",.,," ",405270,7.400," ",30,"J",40.000," ","Yes",.,," ",733.22,"OR001S",14.000,200," ",3," ",.,," ",3,"J",1,1995

479.568,"J",2.1," ",269.46," ",112.824," ",79.000," "," ",06SEP1995,9.100,
3.000," ",88," ",.,22,30.6924," ",45.991677169,-122.8964313,181.0336," ",
260.988," ",0.714,"K",78.532," ",.,," ",405270",6.900," ",20," ",60.000," ",
"Yes",79.116,"J",742.17,"OR001S",14.500,700," ",3," ",.,," ",10," ",2,1995

399.640,"J",.,," ",214.57," ",115.645," ",59.000," "," ",14SEP1995,10.000,
0.500,"K",98," ",6.000,17,30.6924," ",44.138895486,-123.4394569,115.2032," ",
217.49," ",2.142," ",7.853," ",.,," ",405271",7.700," ",10," ",30.000," ",
"Yes",70.788,"J",577.96,"OR003S",14.000,200," ",0.25,"K",.,," ",5," ",1,1995

8. GEOGRAPHIC AND SPATIAL INFORMATION

8.1 Minimum Longitude

-124 Degrees 35 Minutes 10 Seconds West (-124.5862217 Decimal Degrees)

8.2 Maximum Longitude

-119 Degrees 33 Minutes 42 Seconds West (-119.5619 Decimal Degrees)

8.3 Minimum Latitude

42 Degrees 6 Minutes 41 Seconds North (42.1114 Decimal Degrees)

8.4 Maximum Latitude

48 Degrees 10 Minutes 42 Seconds North (48.1784 Decimal Degrees)

8.5 Name of Area or Region

EPA Region 10

The sampling area included the Coast Range Ecoregion and the Yakima River Basin (Columbia Basin Ecoregion).

9. QUALITY CONTROL / QUALITY ASSURANCE

9.1 Data Quality Objectives

See Chaloud and Peck (1994), Merritt (1994), and Hayslip (1993).

9.2 Quality Assurance Procedures

See Chaloud and Peck (1994), Merritt (1994), and Hayslip (1993).

9.3 Unassessed Errors

NA

10. DATA ACCESS

10.1 Data Access Procedures

Data can be downloaded from the WWW site or contact personnel listed in Section 10.3.

10.2 Data Access Restrictions

Data can only be accessed from the WWW server.

10.3 Data Access Contact Persons

Gretchen Hayslip
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Region 10
U.S. Environmental Protection Agency
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Seattle, WA 98101
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206-553-0119 (FAX)
hayslip.gretchen@epamail.epa.gov

Data Librarian EMAP-Information Management
U.S. EPA NHEERL-AED
401-782-3184
401-782-3030 (FAX)
hughes.melissa@epa.gov

10.4 Data Set Format

Data files are in ASCII comma-delimited format.

10.5 Information Concerning Anonymous FTP

Data cannot be accessed via ftp.

10.6 Information Concerning WWW

Data can be downloaded from the WWW site.

10.7 EMAP CD-ROM Containing the Data

Data are not available on CD-ROM.

11. REFERENCES

Chaloud, D.J. and D.V. Peck. 1994. Environmental Monitoring and Assessment Program - Surface Waters: Integrated Quality Assurance Project Plan for the Surface Waters Resource Group, 1994 Activities. EPA 600/X-91/080, Rev. 2.00. U.S. Environmental Protection Agency, Office of Research and Development, Las Vegas, NV 89193.

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Hayslip, G., D.J. Klemm, J.M. Lazorchak. 1994. Environmental Monitoring and Assessment Program Surface Waters and Region 10 Regional Environmental Monitoring and Assessment Program: 1994 Pilot Field Operations and Methods Manual for Streams on the Coast Range Ecoregion of Oregon and Washington and the Yakima River Basin. Office of Research and Development, U.S. Environmental Protection Agency, Cincinnati, OH.

Lazorchak, J.M., D.J. Klemm, and D.V. Peck. (editors). 1998. Environmental Monitoring and Assessment Program - Surface Waters: Field Operations and Methods for Measuring the Ecological Condition of Wadeable Streams. EPA/620/R-94/004F. U.S. Environmental Protection Agency, Washington, D.C.

Merritt, G.D. 1994. Biological Assessment of wadeable Streams in the Coast Range Ecoregion and the Yakima River Basin: Final Quality Assurance Project Plan. Washington State Department of Ecology, Environmental Investigations and Laboratory Services, Olympia, WA, 15 pp.

Oregon Department of Environmental Quality. 1993. DEQ Laboratory Field Sampling Reference Guide. Oregon Department of Environmental Quality, Portland, OR. 29 pp.

Washington Department of Ecology. 1993. Field Sampling and Measurement Protocols for the Watershed Assessment Section. Washington State Department of Ecology, Olympia, WA.

12. TABLE OF ACRONYMS

13. PERSONNEL INFORMATION

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Information Management, EMAP-Surface Waters
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